

On the HEPAP Subpanel Report

Young-Kee Kim
UC Berkeley & LBNL

General Comments on the Report

- A difficult task.
- During report preparation, the committee was able to get a large fraction of the High Energy Physics community involved in the process.
- The presentations and discussions at the committee hearings contributed to creating a consensus in the community.
- The report was well written.
- I agree with the report on the emphasis on Linear Collider since it will be a crucial piece for future of High Energy Physics.
- I very strongly support “vigorous long-term R&D aimed toward future high energy accelerators”. A strong university involvement in accelerator R&D is necessary (Start from LC).

Sensitivity Issues

- Terms, “**superconductivity & nanotechnology**”, appear frequently as technological breakthroughs without recognizing their scientific merits.
 - **This is a good opportunity to recognize Condensed Matter contributions.**
 - **It will help creating a supportive community from other areas.**
- Recommendation 1 : “**manpower**”
 - The sentence could be rephrased without this word.
- Recommendation 3 :
 - The US participation should be undertaken, with the full “**involvement**” of the “**entire**” **particle physics community**.
 - * Good to make an enthusiastic statement.
 - * But this should be rephrased since most likely no more than $\sim 1/2$ of the particle physics community will be involved.
 - The highest priority of the U.S. program, ...
 - ⇒ The highest priority of **the future (yet to be approved)** U.S. program, ...

- **Accomplishments of the LC R&D Program (Section 3.5.1)**
 - **10 paragraphs**
 - **# of lines each paragraph : 5, 5, 6, 5, 5, 3, 7, 6, 2, 4**
Only 3 out of 48 lines discuss KEK's accomplishments. No mention on RF structures they have been building.
 - **I think KEK deserves much more than this.**
 - **Recognizing foreign contributions is crucial for "True International Collaboration".**
- **JLC (Japanese Linear Collider)**
 - **It has changed to Joint Linear Collider.**

*** I don't believe that these are done intentionally. We just have to pay much more attention to these issues.**

Linear Collider

- **Support recommendation of the committee on “one Linear Collider somewhere in the world”.**
- **Community & Education**
 - **We should get as many national labs (including non high energy labs) involved as possible.**
 - **University inclusion in accelerator projects is crucial for community involvement and for training accelerator physicists for the future.**
 - * **Support recomb. of the committee : “the Muon Collider Collab. is a good model”.**
 - * **Broader university Ph.D. program for accelerator R&D associated with Fermilab, SLAC, Cornell, DESY, KEK.**

This will enlarge the particle physics side of the LC community.

- **Communication between HEP and other fields (e.g., Condensed Matter Physics)**
 - * **Recognize their contributions to HEP.**
 - * **APS Plenary talks to educate each other:**
 - **HEP talks at APS condensed matter physics**
 - **Condensed Matter Physics talks at DPF**

- **R&D**

- **More funds for accelerator R&D., especially for University involvement.**
- **Funds should be available for both x-band and super conducting RF design.**
- **Duplication of present LC R&D effort needs to be re-evaluated before US R&D funds are allocated.**

- Physics Case

What should threshold be ?

- Compare to other DOE projects :
 - * Tevatron, SLAC B factory, SNS, APS, RHIC, ALS, CEBAF, ...

The 500-GeV LC budget is about the sum of all the present “large” projects.
 - Preponderance of the “indirect evidence” is that there is exciting physics < 500 GeV.
 - * Is it “beyond a reasonable doubt” ?
 - Physics case in the report for LC being built before any LHC discoveries ?
 - * One could argue that we should wait for early LHC results before making a decision.
- ⇒ Stronger physics case needs to be defined to make a decision before LHC starts.
- Giga-Z, Top Physics, ... can be added.

- **“True” International Cooperation / Collab.**

- **Support recommendation of the committee on “International Partnerships”.**
- **Project should be international from conception**
 - **National committees could be augmented to include one or two international representatives**
 - * **from DESY or KEK**
 - * **from DESY on X-ray FEL (learn how Tesla dealt with non-high energy community)**
- **An international steering committee.**
- **Worldwide Roadmap :**
 - * **Forming a world plan that large projects (a few TeV LC, Muon Collider, VLHC, ...) are sited in different regions.**
 - * **This will format an international consensus on sites and technology.**
- **Communication and collaboration between major players, especially Japan and US, need to be improved.**
- **We need to establish a recognized electron / LC R&D program at Fermilab (who was not a major LC player in the past).**
 - * **One way to do this to create “a central design group” at Fermilab.**

- **National Steering Committee**

- **Support recommendation of the committee on creation of such a committee.**
- **The Steering Committee could**
 - * **define a mechanism to make site selection and technology choice.**
 - * **evaluate various scenarios**
 - **if a LC is built in Germany**
 - **if a LC is built in Japan**
 - **if a LC is built in U.S.A.**

How technical projects (RF structures, Klystrons, Damping Ring, Final Focus, ...) can be shared by various countries / labs. ?

- * **Re-evaluate present effort on Accelerator R&D effort before US R&D funds are allocated in order to avoid duplication.**
- * **Write-up the physics goals in detail**
 - **Add recent physics studies**
 - **This can be delegated to a subcommittee.**